

**RAPTORS AND WATERBIRDS
ON THE GREAT EGG HARBOR RIVER**

ATLANTIC COUNTY, NJ

WINTER, 2006 - 2007

*The Fourth Field Season of a Systematic Study
of an Important Avian Wintering Area*

and including Key Comparisons to the MULLICA RIVER

*and an investigation of
SPRING and FALL MIGRATION
on the Great Egg*

Submitted to: The Great Egg Harbor River Watershed Association



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The water birds and raptors of the Great Egg Harbor River Watershed are one of the many “Outstandingly Remarkable Resource Values” that enabled designation of the river into the National Wild and Scenic Rivers System in 1992. This continuing study provides information on the status and trends of water birds and raptors in the river corridor to assure their long-term protection and promote the importance of wild places in the American landscape, and especially here in South Jersey.

The Great Egg Harbor Watershed Association (GEHWA) would like to recognize and thank the National Park Service, Conectiv Energy, and the Estate of Lynn Ward for their financial support of this stewardship project. Successful public-private partnerships like this are fundamental to the protection of the resources of the Great Egg Harbor and Mullica Rivers.

Special thanks to Clay Sutton and Jim Dowdell, who continue to bring their wealth of bird knowledge and years of professional expertise to the Great Egg Harbor and Mullica Rivers.



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On the Cover

A 1985 Aerial view of Mays Landing looking upriver. Danen Hauer Lane is in the foreground, with views of the Route 40 bridge, Spoony's Marina, Gaskill Park, the old train bridge, and Lake Lenape and the dam in the upper left background. Just to the right of the Lake Lenape Dam is the upper most bird survey sampling site, where Bald Eagles and Osprey are frequently spotted. (35mm slide courtesy of Warren Fox and digitized by Richard Colby).

GREAT EGG HARBOR RAPTORS AND WATERBIRDS

Background and Introduction:

The winter of 2006-2007 marked the fourth field season of ornithological investigations along the Great Egg Harbor River, continuing studies begun in winter 2003-2004 for the Great Egg Harbor Watershed Association. This report details the findings of the core winter raptor and waterfowl survey, as well as the results of key comparisons to the nearby and seemingly similar Mullica River and estuary. Also presented here are second field season studies of the “shoulder seasons” to the core winter period – the important autumn and spring migration seasons.

Because in-depth and extensive reports were presented following the first two field seasons, 2006-2007 findings will be covered in an abbreviated format. This is possible due to the fact that this 2006-2007 report is to be posted on the Great Egg Harbor Watershed Association (GEHWA) web site, where it will appear with the previous three field season reports. Methodology and count locations in 2006-2007 were identical to those used during the previous three field seasons, and goals and objectives of this field research remained the same as well. Accordingly, much of the discussion in the preceding reports remains applicable to this study and these 2006-2007 findings.

Importantly, due to the realities of the budget, the second year of efforts to discover the depth of spring and fall avian migration was enabled by the fact that an in-depth report was not required in this fourth field season of a projected five-year study of the Great Egg. Simply put, man-days that would have been devoted to an elaborate report were instead expended on spring and fall field time. This enabled us to stretch the count well beyond the calendar dates of the core winter season – and to make major discoveries regarding the extent of migration and migration staging on the Great Egg. A full, major in-depth summary report will be prepared at the conclusion of the planned five-year study period.

Findings:

The results of the Great Egg Harbor River Winter Raptor and Waterbird Survey for winter 2006-2007 are shown in **Table 1** (pg 2). Nine full surveys were carried out in the core time period between December 6, 2006 and March 22, 2007. In addition, two fall surveys were conducted (one a partial survey – a transect cruise), and three spring counts were carried out.

TABLE 1-1
2006 – 2007 Great Egg Harbor River Raptor and Waterbird Survey

DATE	FALL		WINTER									SPRING			AVG.
	10/21	11/21	12/6	12/20	1/9	1/17	1/31	2/16	2/28	3/14	3/22	4/9	5/16	5/31	12/6-3/22
LOONS to CORMORANTS															
Red-throated Loon		4	17	1	6	1	15	3	3	11	13	6			
Common Loon		7	3	7	10	1	7	4	23	16	31	10		1	
Pied-billed Grebe		2								1					
Horned Grebe				1		2	5	25	16	12	34	40			
Red-necked Grebe									2						
Double-cr Cormorant	350	147	62	91	67	26	25	36	47	78	66	539	54	49	
Great Cormorant			2					1							
BITTERNS to VULTURES															
American Bittern										1					
Great Blue Heron	26	9	20	29	18	8	11	8	11	5	9	8	2	5	11
Great Egret	20		1		1	1	3		2		2	35	28	36	
Snowy Egret	10											11	26	37	
Little Blue Heron														1	
Tricolored Heron												2		1	
Black-cr Nt-Heron													2	21	
Yellow-cr Nt-Heron												1		1	
Glossy Ibis													1	14	
Black Vulture	3		5	11	11		1	1	2	6	1	9	2	1	4.2
Turkey Vulture	88	76	110	101	116	86	131	69	109	132	100	97	37	46	106
WATERFOWL															
Snow Goose			3												
Canada Goose	15	100	142	169	161	442	84	328	61	140	117	55	45	71	183
Brant	40	1038	1332	963	854	530	346	1011	1190	787	690	1790	150	3	856
Mute Swan		52	51	59	66	65	65	73	70	86	92	68	31	45	
Tundra Swan			9	8	12	10	11	4	2						

10/21/06 – Transect Cruise by boat (Somers Point to Mays Landing). Winter average computed for 12/6/06 to 3/22/07

TABLE 1-2
2006 – 2007 Great Egg Harbor River Raptor and Waterbird Survey

DATE	FALL		WINTER									SPRING			AVG. 12/6-3/22
	10/21	11/21	12/6	12/20	1/9	1/17	1/31	2/16	2/28	3/14	3/22	4/9	5/16	5/31	
Wood Duck									2	2	1				
Gadwall			13	5	8			2		42	4				
American Wigeon			4	1	12				27	35	24				
Am Black Duck	15	130	298	775	319	345	602	520	501	813	479	372	14	14	517
Mallard		2	5	53	42	94	21	44	34	104	39	23	8	47	48
Blue-winged Teal												5			
Northern Shoveler										6					
Northern Pintail				116	13	55	78	9	443	373	253	11			149
Green-winged Teal		5	9	35	1	13	56	35	759	949	828	539			298
Common Teal									2						
Redhead								8	8						
Ring-necked Duck		3				1		15	111	25	57				
Greater Scaup								4002	4158	21	10	1			
Lesser Scaup			1				1	1000	2142	403	1102	2			
Scaup (sp.)		60		800	700	47	160			6555	5000	750			
Surf Scoter					1										
Long-tailed Duck		6	7	20	87	13	112	15	4	167	184	96			
Bufflehead		37	147	368	135	139	235	422	417	541	703	281			345
Com. Goldeneye			1	1		4	11	5	11	35	17				
Hooded Merganser		6	44	72	65	69	25	74	107	2	6	20			
Com. Merganser		1			15		28	22	181	16	7	2			
Red-br Merganser		2	21	52	116	80	40	112	121	178	175	66		1	99
Ruddy Duck										2	4				
DIURNAL RAPTORS															
Osprey	3	1								2	15	38	28	35	
Bald Eagle	11	3	10	8	8	11	12	16	5	1	3	6	3	2	8.2

10/21/06 – Transect Cruise by boat (Somers Point to Mays Landing). Winter average computed for 12/6/06 to 3/22/07

TABLE 1-3
2006 – 2007 Great Egg Harbor River Raptor and Waterbird Survey

DATE	FALL		WINTER									SPRING			AVG. 12/6-3/22
	10/21	11/21	12/6	12/20	1/9	1/17	1/31	2/16	2/28	3/14	3/22	4/9	5/16	5/31	
Northern Harrier	6	35	27	38	26	21	35	14	24	29	16	24	1		26
Sharp-sh Hawk	29	4	2		2			1	1	1	1				0.89
Cooper's Hawk	6	2	2	1		1		2	1	2		1	1		1
Red-sh Hawk						1				1	1				0.33
Red-tailed Hawk	21	46	32	32	57	39	31	49	55	42	30	37	9	10	41
Rough-leg. Hawk				2		1	2	2	2						1
Golden Eagle							1	1							0.22
American Kestrel	7						1				1	2			0.22
Merlin	2						2	1	1	1					0.56
Peregrine Falcon	4	4	3	1	1	2	1		1	6	2				1.89
GROUSE to SHOREBIRDS															
Ring-nk Pheasant			1												
Clapper Rail													4	16	
Black-bellied Plover								3					24	6	
Semipalmated Plover								1					54	48	
Killdeer			1					3		1	4	1			
Am Oystercatcher		26	45	53	1	38	57	20	26	12	27	17	4	11	
Greater Yellowlegs	2	2		3			3		6	15	20	40	3	2	
Lesser Yellowlegs										1		1		1	
Solitary Sandpiper													1		
Willet													51	57	
Spotted Sandpiper													6		
Whimbrel													1		
Sanderling		12					40	25					80	52	
Semipalmated Sdp													821	805	
Least Sandpiper													345	22	

10/21/06 – Transect Cruise by boat (Somers Point to Mays Landing). Winter average computed for 12/6/06 to 3/22/07

TABLE 1-4
2006 – 2007 Great Egg Harbor River Raptor and Waterbird Survey

DATE	FALL		WINTER									SPRING			AVG. 12/6-3/22
	10/21	11/21	12/6	12/20	1/9	1/17	1/31	2/16	2/28	3/14	3/22	4/9	5/16	5/31	
Wh-rumped Sandpiper													1	6	
Dunlin	3	1	30	1	1	60	116	445	2	12		102	3		
Sh-billed Dowitcher													10	3	
Wilson's Snipe		1						2				2			
American Woodcock								2							
Unid. Shorebird (sp.)													225		
TOTAL SHOREBIRDS												163	1629	1013	
JAEGERS to ALCIDS															
Laughing Gull	x	2								9	5	50	x	x	
Bonaparte's Gull			15	150	1	1					13	1	1		
Ring-billed Gull	x	x	x	x	x	x	x	x	x	x	x	x	x	1	
Herring Gull	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Lesser BI-bkd Gull											1	1			
Gt BI-backed Gull	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Gull-billed Tern													1	1	
Caspian Tern			1										1	1	
Common Tern														4	
Forster's Tern	x											5	183	99	
Least Tern													2	10	
PIGEONS to WOODPECKERS															
Belted Kingfisher	1	4	6	6	4	3	2	1	3	1	2	1			

10/21/06 – Transect Cruise by boat (Somers Point to Mays Landing). Winter average computed for 12/6/06 to 3/22/0

Table 1 also shows the core season average (mean) count for key species, and peak winter daily high counts are shown in **boldface**. While average counts are of value in comparing data from year to year, and in part reflect the amount of time that birds spend on the river over the season (as well as the inevitable impacts of both daily and prolonged weather conditions upon count results), the peak count for many species far better reflects the true numbers present. For example, the peak of 1,332 Brant recorded on December 6 far better reflects the number actually present than the 346 counted on January 31. Weather, ice, cloud conditions, and access, as well as local movements of birds, can greatly vary and alter the results of any given survey. This is why a minimum of 7-10 surveys are required to truly assess bird populations present in the system.

Wintering raptors - birds of prey - were again found to be a hallmark of the Great Egg Harbor River in winter. Peaks, averages, and temporal distribution can be seen in Table 1 and will be discussed more fully below. Winter waterfowl numbers were again found to be substantial, and by extending the time frame of the surveys into spring, we gained insight into the importance of the Great Egg as a spring migration stopover and staging area for ducks and geese.

Comparison to Previous Season's Findings:

The comparison of the core winter season 2006-2007 findings to the previous three field seasons are shown in **Table 2** (pg 8). Shown are peaks and averages for key species for all four winter field seasons. No doubt due to the mild winter, waterfowl numbers were somewhat down across the board, although numerous respectable totals nicely confirm and corroborate the findings in previous years. Only Green-winged Teal posted a new high seasonal average – and this is in fact a result of the mild winter, as spring migrants flooded north in late February and early March.

Several new raptor peaks were achieved. Turkey Vulture numbers continue to grow in the region, and both new daily peaks and high seasonal averages were achieved. Black Vulture populations on the Great Egg, while not at record levels, remained high as well.

Peregrine Falcon numbers were high as well. A new daily record of six was recorded on March 14, and the seasonal average of 1.89 birds per survey was the second highest recorded. It appears that two pairs of Peregrines are resident on the river.

While Bald Eagle numbers were good – second highest peaks and averages (tie) were attained – and Red-tailed Hawk numbers were healthy, most raptor species were down in numbers in winter 2006-2007. Sharp-shinned Hawk tied its lowest average, and Cooper's Hawk showed its lowest peaks and averages in all four field seasons – a curious finding for this increasing raptor. Red-shouldered Hawk also showed its lowest numbers in the past four field seasons.

Rough-legged Hawk counts and to a lesser degree Golden Eagle counts were no doubt down due to the mild winter – particularly the mild late fall and early winter period. Rough-legs simply did not make an incursion into the region from their preferred northern haunts this winter, and the estimated 4-5 individuals present in the Great Egg system were in fact a high portion of the number in the entire southern New Jersey region in 2006-2007.

Once again, the American Kestrel numbers were abysmal, and no kestrels truly wintered on the river in 2006-2007. The single bird seen on March 22 was an early spring migrant, and the bird at Longport on January 31 apparently was pushed into the region temporarily by snow cover to the north. On the other hand, several Merlin wintered in the area. It is sobering to think that both Merlin and Peregrine far outnumbered American Kestrel in the region – a bird that was once, in the author’s own memory, not only the commonest falcon of the area but also one of our commonest raptors. Drastic action is needed to protect the kestrel from extirpation as a nesting (and wintering) bird in New Jersey.

Comparisons to the Mullica River:

As in 2004-2005 and in 2005-2006, comparative studies were conducted on the Mullica River in an attempt to place the Great Egg findings in a greater regional perspective and context. Mullica River winter raptor and waterfowl daily totals are shown in **Table 3** (pg 9). Peaks and averages are shown. These findings are shown in comparison to the past two winter field seasons on the Mullica in **Table 4** (pg 11). A number of new peak and average counts were accrued.

Canada Goose posted new daily peaks and high averages in 2006-2007, although these numbers were in part an artifact of the high number of migrant Canadas in the region on December 8 (the day of the first Mullica survey) – geese that subsequently moved on to winter farther south. While Brant showed a new record as well, this was by a slight margin. Mallard particularly (and unlike on the Great Egg), bucked the regional mild winter trend, inexplicably posting new highs by a fair margin. Bufflehead too showed a new high (446 on December 21, 2006) on the Mullica River system during this third comparative study effort.

Among raptors, Black Vulture showed a new high of 15, and a good average, yet Turkey Vulture, quite unlike on the Great Egg, were well down on the Mullica in 2006-2007 for unknown reasons. Hawk numbers on the Mullica mostly mirrored the mild winter trends seen on the Great Egg Harbor River, with numbers of all species average to below average. Only Golden Eagles reversed this situation, due largely to the excellent four recorded on January 23 (when two adults and an immature were seen together near Leeds Point and a second, different immature was seen over Amasas Landing). Golden eagles remain a hallmark of the vast Mullica complex in winter.

The comparison of winter 2006-2007 raptor and waterfowl totals for the Great Egg Harbor River and the Mullica River are shown in **Table 5** (pg 12). Avian populations of these two major river systems are remarkably similar in many ways. Among waterfowl, Northern Pintail, Green-winged Teal and Bufflehead appear to be far more common on the Great Egg, although the caveats expressed in previous reports (particularly those regarding Forsythe NWR) need to be kept in mind during any data review and comparison.

The Great Egg edged the Mullica in peak Bald Eagle numbers this field season, yet the averages were nearly identical – and excellent for both rivers. Northern Harrier peaks and averages were also remarkably similar, and although Mullica accipiter numbers bested the Great Egg, it was not by a wide margin. (And, unlike other raptors, simple “luck” plays a large role in censusing these secretive forest dwelling hawks – accipiters are simply not as readily visible as the other species surveyed.) Red-tailed Hawks remain significantly more numerous on the Great Egg than on the Mullica River – for largely unknown reasons. In 2006-2007, Rough-legged peaks and averages were identical, and falcon numbers quite similar.

TABLE 2

Great Egg Harbor River Comparison of Winter Raptor / Waterfowl Totals

2003-2004, 2004-2005, 2005-2006, 2006-2007

	2003- 2004			2004- 2005			2005- 2006			2006- 2007	
	PEAK	AVG.		PEAK	AVG.		PEAK	AVG.		PEAK	AVG.
WATERFOWL:											
Canada Goose	764	322		906	359		474	267		442	183
Brant	2,425	985		5,440	3,125		1,570	893		1,332	856
Am. Black Duck	1,238	365		1,115	647		868	481		813	517
Mallard	220	73		172	74		203	82		104	48
Northern Pintail	497	106		484	132		644	212		443	149
Green-winged Teal	1,032	172		859	229		1,140	276		949	298
Bufflehead	1,168	467		599	343		815	418		703	345
Red-breasted Merganser	172	86		180	92		165	79		178	99
RAPTORS:											
Black Vulture	5	1.50		5	3.20		16	6.40		11	4.20
Turkey Vulture	120	61.00		110	76.00		106	86.00		132	106.00
Bald Eagle	14	8.25		11	7.30		18	8.90		16	8.20
Northern Harrier	41	31.00		47	36.00		37	27.00		38	26.00
Sharp-shinned Hawk	3	0.88		7	1.70		5	2.40		2	0.89
Cooper's Hawk	3	1.13		5	1.90		4	2.00		2	1.00
Red-shouldered Hawk	4	0.90		3	0.63		1	0.43		1	0.33
Red-tailed Hawk	57	40.00		56	45.00		59	42.00		57	41.00
Rough-legged Hawk	9	3.38		10	4.60		5	2.30		2	1.00
Golden Eagle	1	0.38		2	0.80		2	0.43		1	0.22
Am. Kestrel	0	0.00		3	0.30		4	0.57		1	0.22
Merlin	1	0.11		2	0.30		0	0.00		2	0.22
Peregrine Falcon	3	1.38		3	1.60		4	2.70		6	1.89

New **high counts** (peaks and averages) that were set in 2006-2007 are shown in **Bold Face**

TABLE 3-1
2006 – 2007 Mullica River Raptor and Waterbird Survey

							WINTER
DATE	12/8	12/21	1/6	1/23	2/8	2/22	AVG.
LOONS to CORMORANTS							
Red-throated Loon	9	25	14	15		2	
Common Loon	2	7	5	15		16	
Pied-billed Grebe		4		3	3	2	
Horned Grebe	2	4	1	3		9	
Red-necked Grebe						1	
N. Gannet		4		1			
Double-cr Cormorant	42	10	4				
BITTERNs to VULTURES							
American Bittern			1			1	
Great Blue Heron	18	22	10	21	9	11	15.00
Great Egret				3			
Black Vulture			5	15	8		4.70
Turkey Vulture	58	55	88	82	36	25	57.00
WATERFOWL							
Snow Goose	1080	205	200			16	
Canada Goose	1293	464	230	706	412	174	547.00
Brant	970	1800	525	1325	550	648	970.00
Mute Swan	4	5	19	6	2	4	
Tundra Swan			1		15		
Gadwall			2	11	2	8	
American Wigeon						1	
Am Black Duck	246	275	232	601	349	383	348.00
Mallard	400	489	266	383	428	170	356.00
Northern Shoveler					1		
Northern Pintail	6	1		20	1	30	10.00
Green-winged Teal	2				21	4	5.00
Canvasback	2					1	
Redhead	24	7	1			3	
Ring-necked Duck	4	9	4	32		10	
Greater Scaup	1	1		1			
Lesser Scaup	1	45			4		
Scaup (sp.)	4	451	300	2	85	45	
Common Eider	3						
Surf Scoter		9	1				
Black Scoter				1			
Scoter (sp.)	20	40					
Long-tailed Duck	16	55	9	26	10	18	
Bufflehead	45	446	56	112	240	405	217.00
Com. Goldeneye		12		5	10	25	

Peak Counts shown in Bold Face

TABLE 3-2
2006 – 2007 Mullica River Raptor and Waterbird Survey

							WINTER
DATE	12/8	12/21	1/6	1/23	2/8	2/22	AVG.
Hooded Merganser	82	45	208	189	184	146	
Com. Merganser			1	3	11	43	
Red-br Merganser	1	36	28	62	72	95	49.00
Ruddy Duck		2		1	2		
DIURNAL RAPTORS							
Bald Eagle	14	7	4	12	10	6	8.80
Northern Harrier	21	36	37	33	22	33	30.00
Sharp-sh Hawk	1	1	3	2		2	1.50
Cooper's Hawk		4	1	2	1	1	1.50
Red-sh Hawk							0.00
Red-tailed Hawk	18	14	40	30	19	23	24.00
Rough-leg. Hawk	1	1		2		2	1.00
Golden Eagle	1		1	4	2		1.33
American Kestrel							0.00
Merlin		1	1				0.33
Peregrine Falcon	1	4	1	2	3	5	2.67
GROUSE to CRANES							
Clapper Rail	1						
American Coot	5	4	3	5	5	4	
SHOREBIRDS							
Black-bellied Plover	2		11		1	1	
Killdeer		7					
Am. Oystercatcher	15					6	
Greater Yellowlegs	4	6	2	8		1	
Lesser Yellowlegs						1	
Marbled Godwit	8						
Ruddy Turnstone	2			1			
Dunlin	270	15	2500	201	137	85	
Wilson's Snipe			2		2	1	
Am. Woodcock					7		
JAEGERS to ALCIDS							
Laughing Gull	3						
Bonaparte's Gull		4	3				
Ring-billed Gull	x	x	x	x	x	x	
Herring Gull	x	x	x	x	x	x	
Lesser Bl-bk Gull						2	
Gt Bl-backed Gull	x	x	x	x	x	x	
PIGEONS to WOODPECKERS							
Great Horned Owl		1					
Belted Kingfisher	1	2	3	4		2	

Peak Counts shown in Bold Face

TABLE 4
Comparison of Winter Raptor and Waterfowl Totals
Mullica Rover
2004-2005, 2005-2006, 2006-2007

	2004- PEAK	2005 AVG.		2005- PEAK	2006 AVG.		2006- PEAK	2007 AVG.
WATERFOWL:								
Canada Goose	366	174		980	463		1,293	547
Brant	1,421	793		1,785	706		1,800	970
Am. Black Duck	530	312		892	442		601	348
Mallard	365	196		334	220		489	356
Northern Pintail	-	-		20	7		30	10
Green-winged Teal	22	8		2	1		21	5
Bufflehead	150	67		365	230		446	217
Red-breasted Merganser	410	116		98	64		95	49
RAPTORS								
Black Vulture	9	5.20		8	3.80		15	4.70
Turkey Vulture	119	70.00		114	71.00		88	57.00
Bald Eagle	20	10.80		11	8.00		14	8.80
Northern Harrier	42	31.00		48	38.00		37	30.00
Sharp-shinned Hawk	2	1.20		4	2.20		3	1.50
Cooper's Hawk	3	1.60		4	1.30		4	1.50
Red-shouldered Hawk	3	1.00		0	0.00		0	0.00
Red-tailed Hawk	39	31.00		42	34.00		40	24.00
Rough-legged Hawk	21	10.60		12	6.20		2	1.00
Golden Eagle	2	0.80		2	1.00		4	1.33
Am. Kestrel	2	0.80		0	0.00		0	0.00
Merlin	2	0.40		1	0.17		1	0.33
Peregrine Falcon	5	4.00		4	3.20		5	2.67

New **high counts** (peaks and averages) that were set in 2006-2007 are shown in **Bold Face**

TABLE 5

Comparison of Winter 2006-2007 Raptor and Waterfowl Totals

Great Egg Harbor River and Mullica River

	GREAT EGG HARBOR RIVER		MULLICA RIVER	
	PEAK	AVG.	PEAK	AVG.
WATERFOWL:				
Canada Goose	442	183	1,293	547
Brant	1,332	856	1,800	970
Am. Black Duck	813	517	601	348
Mallard	104	48	489	356
Northern Pintail	443	149	30	10
Green-winged Teal	949	298	21	5
Bufflehead	703	345	446	217
Red-breasted Merganser	178	99	95	49
RAPTORS				
Black Vulture	11	4.20	15	4.70
Turkey Vulture	132	106.00	88	57.00
Bald Eagle	16	8.20	14	8.80
Northern Harrier	38	26.00	37	30.00
Sharp-shinned Hawk	2	0.89	3	1.50
Cooper's Hawk	2	1.00	4	1.50
Red-shouldered Hawk	1	0.33	0	0.00
Red-tailed Hawk	57	41.00	40	24.00
Rough-legged Hawk	2	1.00	2	1.00
Golden Eagle	1	0.22	4	1.33
Am. Kestrel	1	0.22	0	0.00
Merlin	2	0.22	1	0.33
Peregrine Falcon	6	1.89	5	2.67

Discussion:

There were many highlights to the 2006-2007 Great Egg Harbor River and Mullica River studies. “Year Four” results clearly confirm and corroborate previous findings on these important coastal rivers. The Great Egg Harbor River continues to support regional high and significant populations of raptors and waterfowl in winter.

Avian numbers on the Great Egg Harbor and Mullica Rivers were clearly affected by weather patterns during the winter of 2006-2007. Unseasonably warm weather in December and January were a major factor in low waterfowl and raptor numbers; simply put, many of our expected winter birds remained north of New Jersey for the winter. December 2006 was one of the warmest on record for New Jersey, following a November that was the warmest for the Garden State in 112 years of weather record-keeping. These led 2006 to be the second warmest year ever in New Jersey. January 2007 was mild as well, and in late January the ocean water temperature off Atlantic City was 41.5 degrees – 4.5 degrees above normal. Also, while precipitation was near average, there was virtually no snow recorded.

February 2007 did bring true winter conditions to the region, but for birds, this came at a time when wintering patterns and regions were already well established. Most waterfowl and many key raptor species never migrated into the South Jersey region in winter 2006-2007, and Great Egg and Mullica survey results reflect this expected mild winter situation. Several February surveys however did encounter considerable ice in the area, with impoundments frozen and bays partially blocked with ice. This is a time when local waterfowl are concentrated in open water areas, although some birds will temporarily relocate farther south to escape frozen conditions.

We believe that the Great Egg Harbor region avian populations are truly being impacted by climate change, yet with so many recent winters being mild, it is difficult to gather a baseline of data on what constitutes normal avian-use patterns during an “old-fashioned winter.” While long-term studies are designed to determine status and trends, the four years of Great Egg study to date have mostly been characterized by winter weather that is far warmer than normal, with only winter 2004-2005 partially reversing that trend. More review and analysis is planned on these issues, but we would love to see a truly cold November and December in order to assess this weather’s impact on regional waterfowl and raptor numbers.

Autumn and Spring Migration on the Great Egg Harbor River:

Migration season studies in spring and fall showed the Great Egg to be an important raptor and waterfowl area well beyond the winter season period previously studied. Table 1 also includes results of coverage in October, November, April, and May.

A transect cruise was done on October 21 as part of a Cape May Bird Observatory/GEHWA natural history outing and tour of the river. The route covered from Somers Point to Mays Landing. The cruise followed a cold front, and considerable raptor migration was noted along the river. 3 Osprey, 11 Bald Eagles, 6 Northern Harriers, 29 Sharp-shinned Hawks, 6 Cooper’s Hawks, 21 Red-tailed Hawks, 7 American Kestrel, 2 Merlin and 4 Peregrine Falcons were counted. Almost all of these

birds were judged to be migrants. Particularly noteworthy was the corroboration of 2005 autumn counts, establishing that under strong northwest winds Sharp-shins, Cooper's, and Kestrel were reluctant to cross Great Egg Harbor Bay, and virtually all were counted moving west up the treeline. It was only near Mays Landing that birds were eventually noted crossing the now less than half-mile wide river. It is well-known that raptors do not like to cross open water, but to our knowledge, their reluctance to cross Great Egg Harbor Bay and river basin marshes had never been documented and is a significant finding from the past two autumn season studies.

The importance of this is that it places new emphasis and importance on the forested buffer to the river -- the upland edges -- as an important migration diversion line and stopover habitat for raptors. Most raptors forage during migration, including opportunistic feeding during actual migratory flight, and the Great Egg forested buffer clearly exhibits heavy use by birds of prey during migration. It is important to note that migration is a particularly perilous and stressful part of the life cycle of raptor species.

Migratory use of the Great Egg was not limited to fall. Spring counts (using the same methodology as the winter counts) discovered waterfowl and waterbird use that extended well beyond the classic winter period. Wading birds (herons, egrets, and ibis) were abundant in spring, and waterfowl use for many species extended through April. The presence of Northern Harrier and Cooper's Hawks in the region as late as May 16 strongly indicates breeding by these species as well.

Particularly significant were the numbers of shorebirds found using Great Egg area mudflats, impoundments, and beaches in spring. 1,629 shorebirds were found along the Great Egg on May 16, mostly in the Tuckahoe WMA impoundments and on mudflats east of the Garden State Parkway bridge. 1,013 shorebirds were recorded on the late date of May 31, as well. Of note, this is no doubt only a small portion of those probably present; the lower bay is large, viewing distances are far in many cases, and haze and heat waves preclude identification and counting to a great degree. We feel the May counts only hint at the shorebird use and potential of Great Egg Harbor Bay. The techniques and methodology used for raptors and waterfowl do not do shorebirds justice; precise counts of the lower bay could only be achieved by boat and by carrying out transects during the low tide cycle. None-the-less, 2007 studies corroborate spring 2006 efforts and prove that the Great Egg Estuary is highly important to migratory shorebirds in spring (and no doubt fall as well) and confirms exceptional avian ecovalues for the region for all seasons of the year.

Highlights and Other Sightings of Note:

While the Great Egg Harbor River raptor and waterbird surveys are a directed and targeted scientific effort, there were inevitably some wonderful "birding" highlights as well. Basically, you can't spend this amount of time on the Great Egg and not see good (and significant) birds.

On December 6, a Caspian Tern was seen migrating south over the Corbin City dike (Tuckahoe WMA), an astoundingly late date for New Jersey and by far the latest that the authors had ever seen. Many of the notable sightings were no doubt related to the mild winter; a Tree Swallow was at Gibson's Landing on February 28, and along the Mullica 5 Tree Swallows were seen on February 22, all very early spring migrants heading north at the end of February's brief freeze-up. (Two Tree Swallows found wintering on the Mullica on January 23 probably did not survive February's freeze).

The Bald Eagle nest near Gibson's Landing was again active in 2007, and the eagles were discovered sitting on eggs on the very early date of January 31, 2007. On March 14, we determined that the nest had sadly failed for unknown reasons. In 2006, this nest produced two young. On the Mullica River, the Bald Eagles were on eggs at the Wading River nest on January 23, and this nest subsequently fledged two young on May 26, 2007. In 2006, this nest also produced two young.

Other Great Egg highlights included a 3rd winter Lesser Black-backed Gull at Longport on March 22, and an adult Lesser Black-backed Gull found on April 9. On the Mullica surveys, 2 Lesser Black-backed gulls were found at the tip of Great Bay Boulevard on February 22. Lesser Black-backed Gulls are rapidly increasing both in New Jersey and throughout North America.

A "lowlight" was on February 16 when the 496 shorebirds at Longport Sod Banks (aka Malibu Beach WMA, aka "Dog Beach") were flushed by running dogs. Highly stressed by the February cold and ice, the shorebirds, including 20 American Oystercatcher, were repeatedly flushed by dogs off their leashes at this important and long-known shorebird use-area – a sad situation that is apparently condoned by DEP.

Another "low" was the all-time low of one Bald Eagle recorded on the Great Egg on March 14 – when extremely poor visibility due to haze and heat waves impacted the day's count (and our overall Bald Eagle average) to a degree never experienced previously.

Spring highlights included two drake Common Teal (one at Tuckahoe, one at Corbin City) on February 28. Common Teal are now "expected" on the Great Egg in late winter / early spring. A Pileated Woodpecker was repeatedly heard drumming at Gibson's Landing on March 14, the first confirmation of this species during the four years of this study effort. The Corbin City / Estell Manor region is one of only two places in southern New Jersey where this large, iconic, and enigmatic woodpecker is known to nest.

On May 16, 2 Least Terns were recorded at Somers Point and Longport, and a Gull-billed Tern was at Somers Point. On May 31, at least ten Least Terns were tallied, and a Gull-billed Tern was at Tuckahoe WMA, along with a very late Caspian Tern. A Yellow-crowned Night Heron was found DOR (freshly dead on the road) in Somers Point on April 9 and one was seen flying into the Route 52 causeway nesting colony (near the Ninth Street Bridge) on May 31. Also on May 31, 6 Diamond-backed Terrapins were laying eggs on the Corbin City WMA dike – an important nesting area indeed for this saltwater turtle.

One great find was made on the Mullica River on January 23, 2007. At the Garden State Parkway Bridge observation point near Port Republic, an immature male Western Tanager was seen and watched at close range for about fifteen minutes. It was subsequently seen by a number of observers the following day, but was sadly found dead several days later – no doubt a victim of the brief but severe cold weather that occurred in late January and early February. Its presence on January 23 was no doubt a result of the extremely mild late fall and early winter. The Western Tanager is a rare vagrant to New Jersey, with only about 30 state records. Our sighting was one of only two or three ever recorded in Atlantic County and a wonderful example of southern New Jersey's attractiveness to vagrant birds – in this case a beautiful and memorable neotropical migrant.

Finally, THE glowing highlight of the winter 2006-2007 survey was one of the few truly winter weather related events. Previous reports have noted the exceptional flock of scaup which are usually found on Great Egg Harbor Bay in late winter and early spring, yet this seasonal gathering was largely absent in 2005-2006 – no doubt due to the mild winter. In 2006-2007 the harsh February weather and

freeze-up of waters farther to the north sent huge numbers of scaup to the Great Egg.

On January 31, only a paltry 161 scaup were tallied, but amazingly, just two weeks later, 5,000 were found in the lower bay behind Ocean City. By March 14, some 7,000 scaup were present, an estimated 4,000 plus Greater Scaup and over 2,000 Lesser Scaup. And, this amazing gathering contained at least 8 Redheads – always a rare find and treat in southern New Jersey waters. Interestingly, the Mullica River / Great Bay area did not attract nearly as many scaup, with only 500 counted there in 2006-2007. The Holgate / Little Egg Inlet area did however host up to 24 Redheads, 2 Canvasbacks, and 3 Common Eider on December 8 – all seen from the foot of Great Bay Boulevard (Seven Bridges Road) – all significant finds for the region. 24 Redheads are an extremely high total for southern New Jersey. Also seen at Great Bay Boulevard were 8 Marbled Godwits on December 8, a good winter find. A cooperative Red-necked Grebe was on the Mullica at Mott's Creek on February 22 and was subsequently enjoyed by Dr. Jack Connor's Stockton College Ornithology Class on February 24.

Summary and Acknowledgments:

At the conclusion of year four of the planned five-year study of the avian resources of the Great Egg Harbor River (and as our comparison, year three of the ancillary Mullica River surveys), we have documented an amazing array of avian-use of these key South Jersey rivers. Winter 2006-2007, and the spring and fall season migration surveys, have confirmed and corroborated the first three years of effort and have added to a body of work that documents and substantiates the Great Egg Harbor estuary as a key avian resource area of southern New Jersey. As we enter the fifth year of the study, we look forward to the additional discoveries that are sure to be ahead.

We thank the friends, members, and supporters of the Great Egg Harbor Watershed Association for allowing us to be a part of these discoveries. It is in no small measure because of all of you that the Great Egg remains wild – and that there remain avian discoveries to be made, and that there are still places for the unexpected.

We also heartily thank both Conectiv Energy and the U.S. Department of the Interior's National Park Service, Wild and Scenic Rivers Program and for their assistance to the Great Egg Harbor Watershed Association. The award of a Wild and Scenic River Partnership Grant enabled these surveys to be carried out. Thank you for all of your important work in Southern New Jersey, and for your ongoing vision of a wild and scenic Great Egg Harbor River.

Clay Sutton

Appendix I:

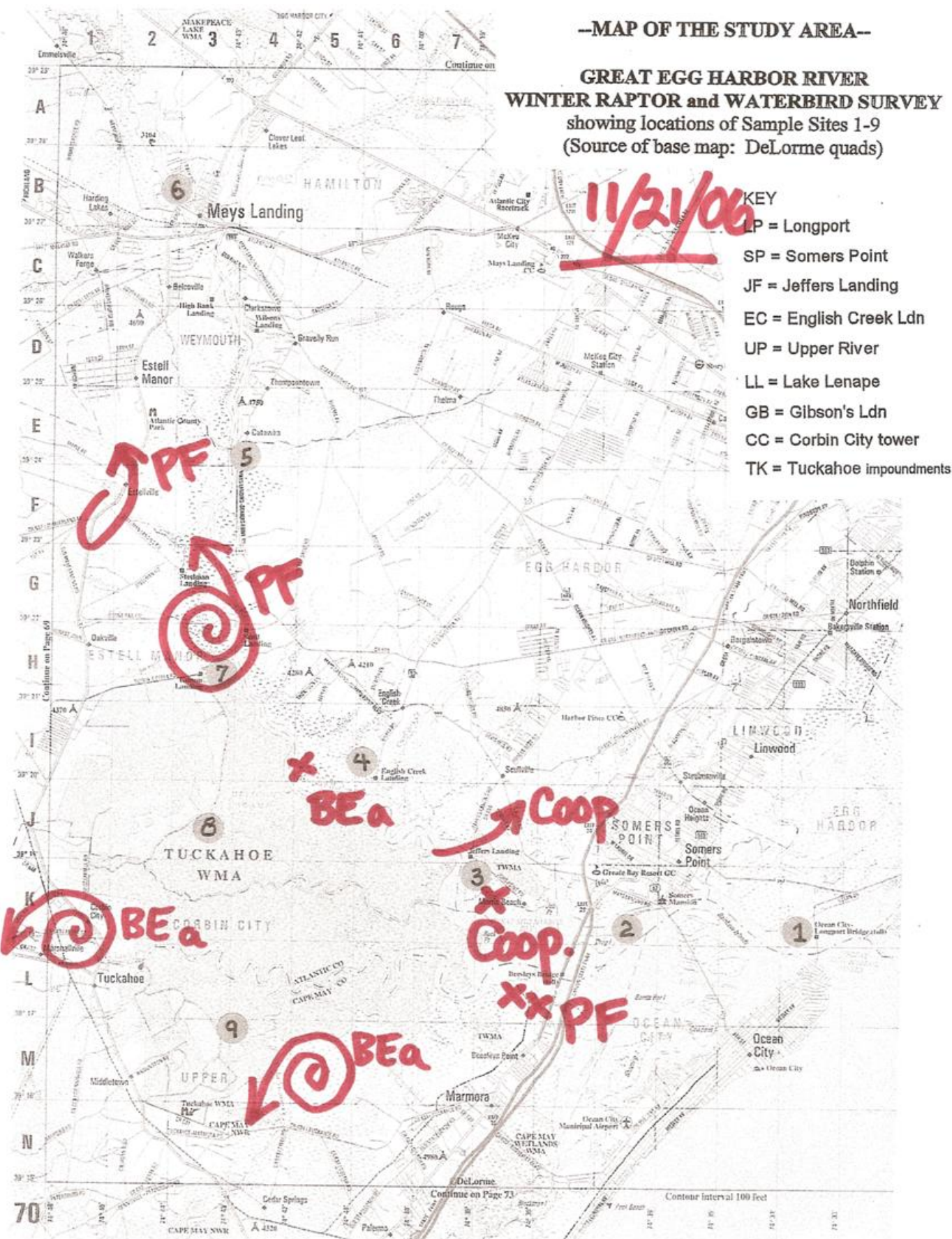
Rare, Threatened, and Endangered Species

Field Mapping

2006 – 2007

KEY:

BE	Bald Eagle
NH	Northern Harrier
CP	Cooper's Hawk (also: Coop.)
NG	Northern Goshawk
RS	Red-shouldered Hawk
GE	Golden Eagle
PG	Peregrine Falcon
SE	Short-eared Owl
AB	American Bittern
RH	Red-headed Woodpecker
a	Adult
i	Immature

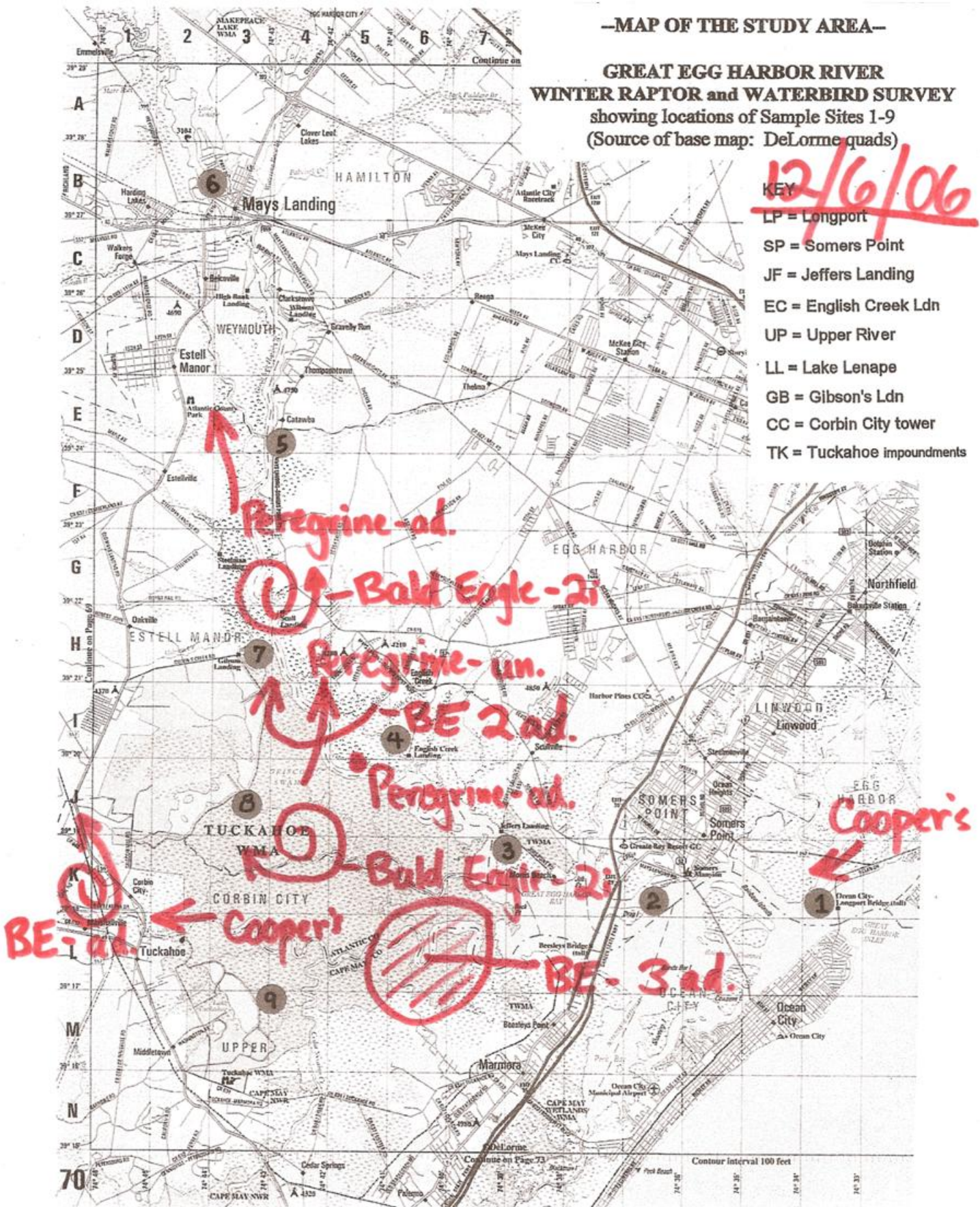


—MAP OF THE STUDY AREA—

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

KEY

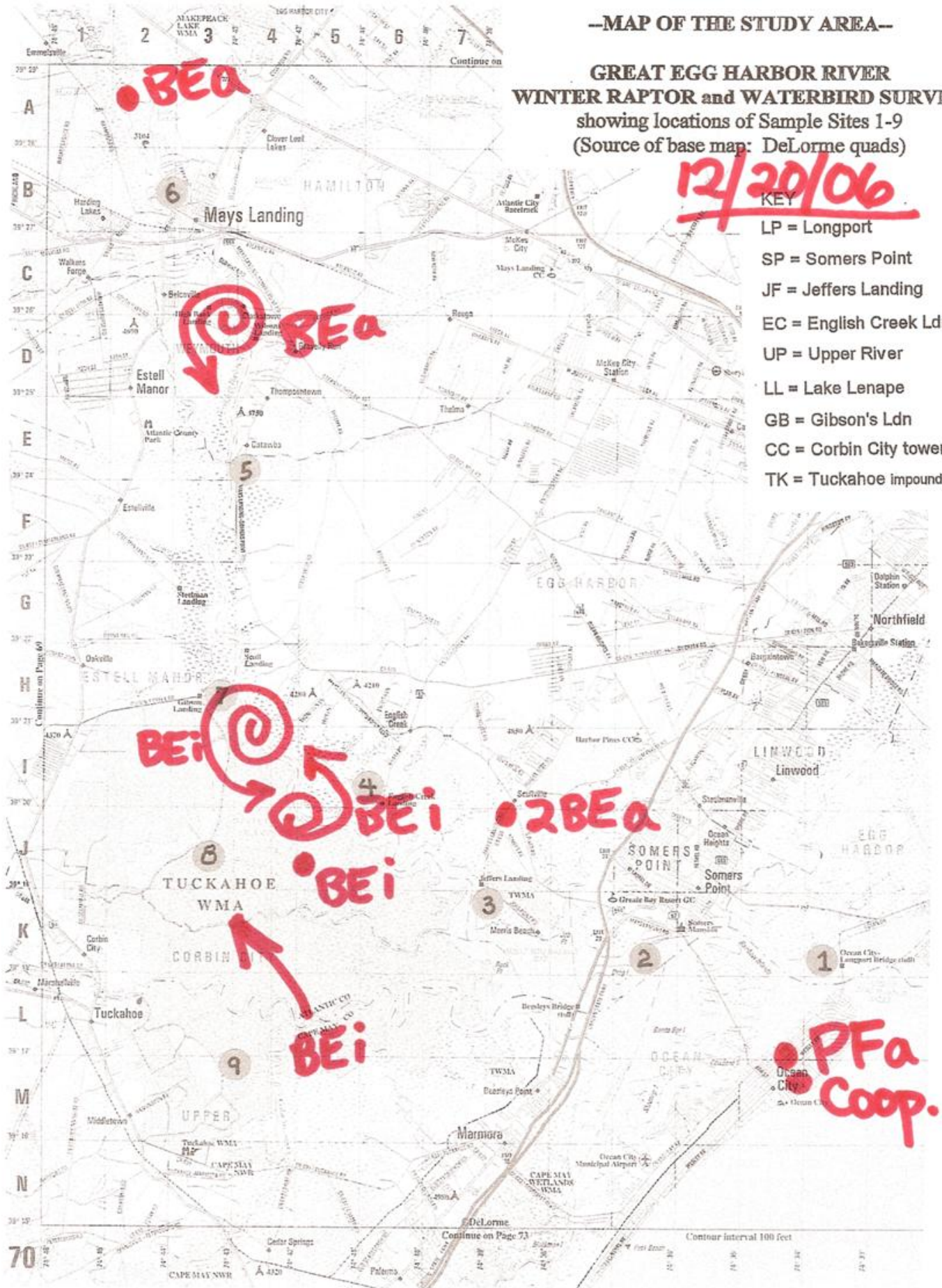
- LP = Longport
SP = Somers Point
JF = Jeffers Landing
EC = English Creek Ldn
UP = Upper River
LL = Lake Lenape
GB = Gibson's Ldn
CC = Corbin City tower
TK = Tuckahoe impoundments



-MAP OF THE STUDY AREA-

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

12/20/06
KEY
LP = Longport
SP = Somers Point
JF = Jeffers Landing
EC = English Creek Ldn
UP = Upper River
LL = Lake Lenape
GB = Gibson's Ldn
CC = Corbin City tower
TK = Tuckahoe impoundments



KEY

LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

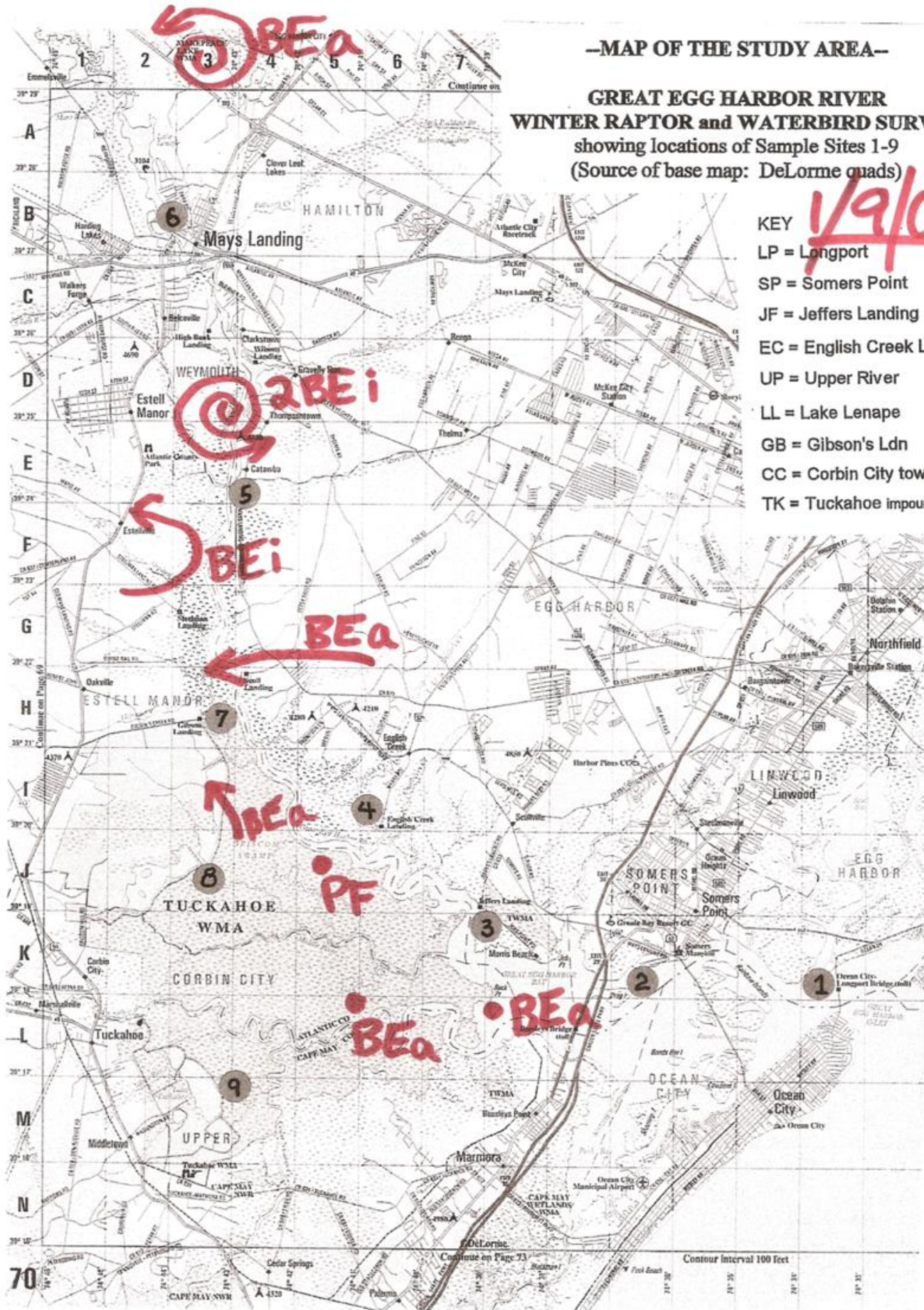
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—MAP OF THE STUDY AREA—

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

KEY

LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

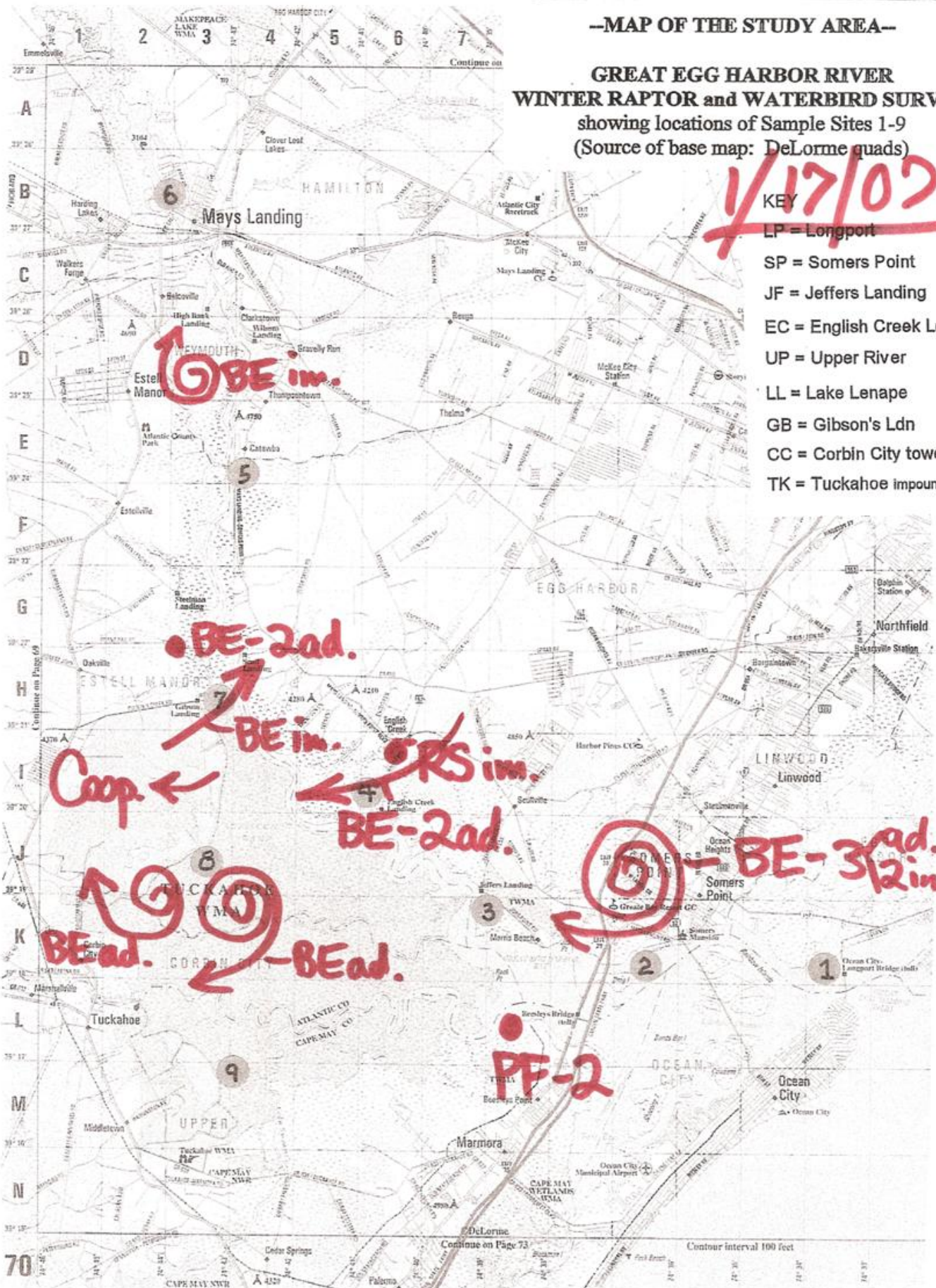
UP = Upper River

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CC = Corbin City tower

TK = Tuckahoe impoundments

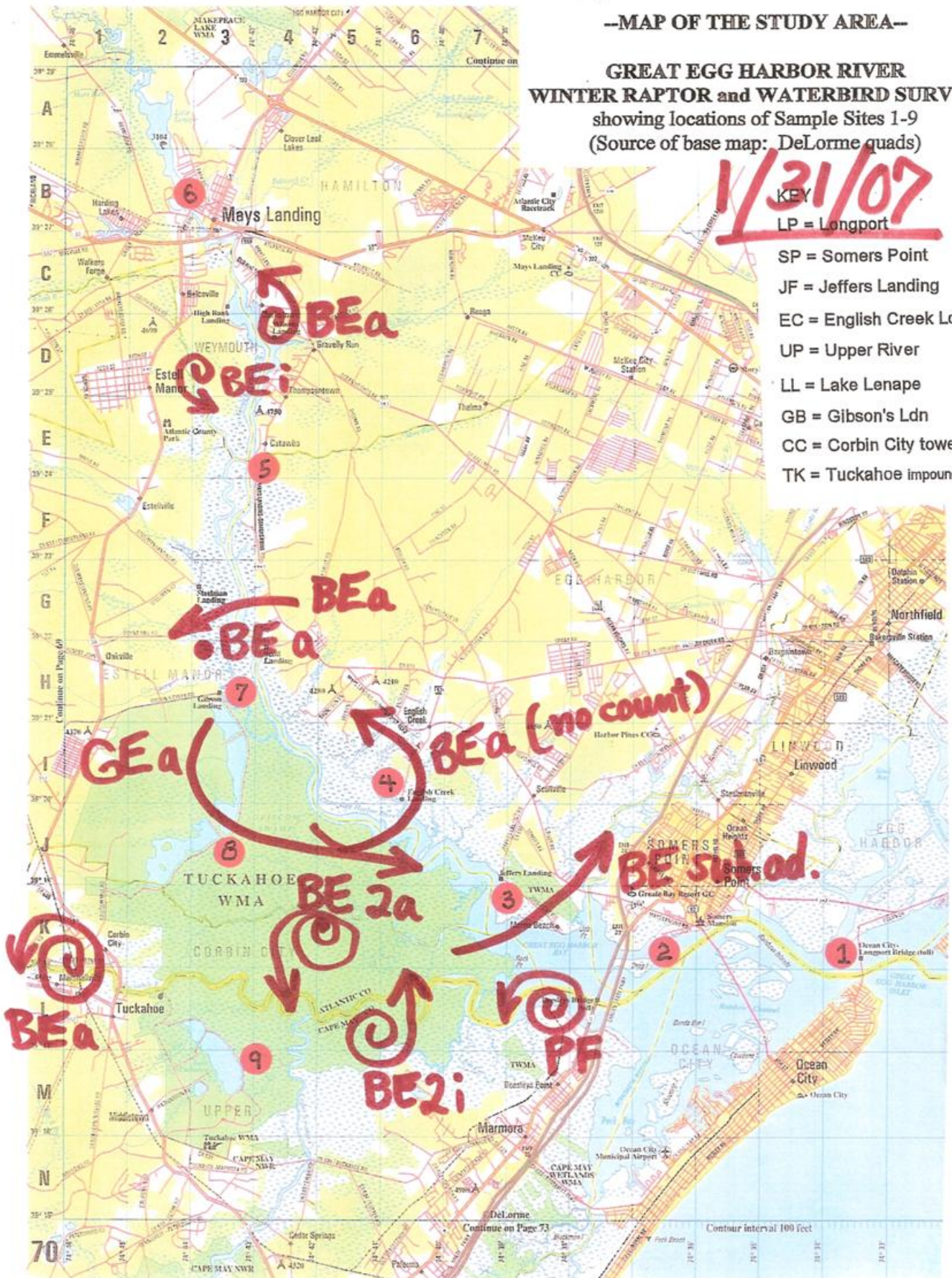


--MAP OF THE STUDY AREA--

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

1/31/07
KEY
LP = Longport

- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments

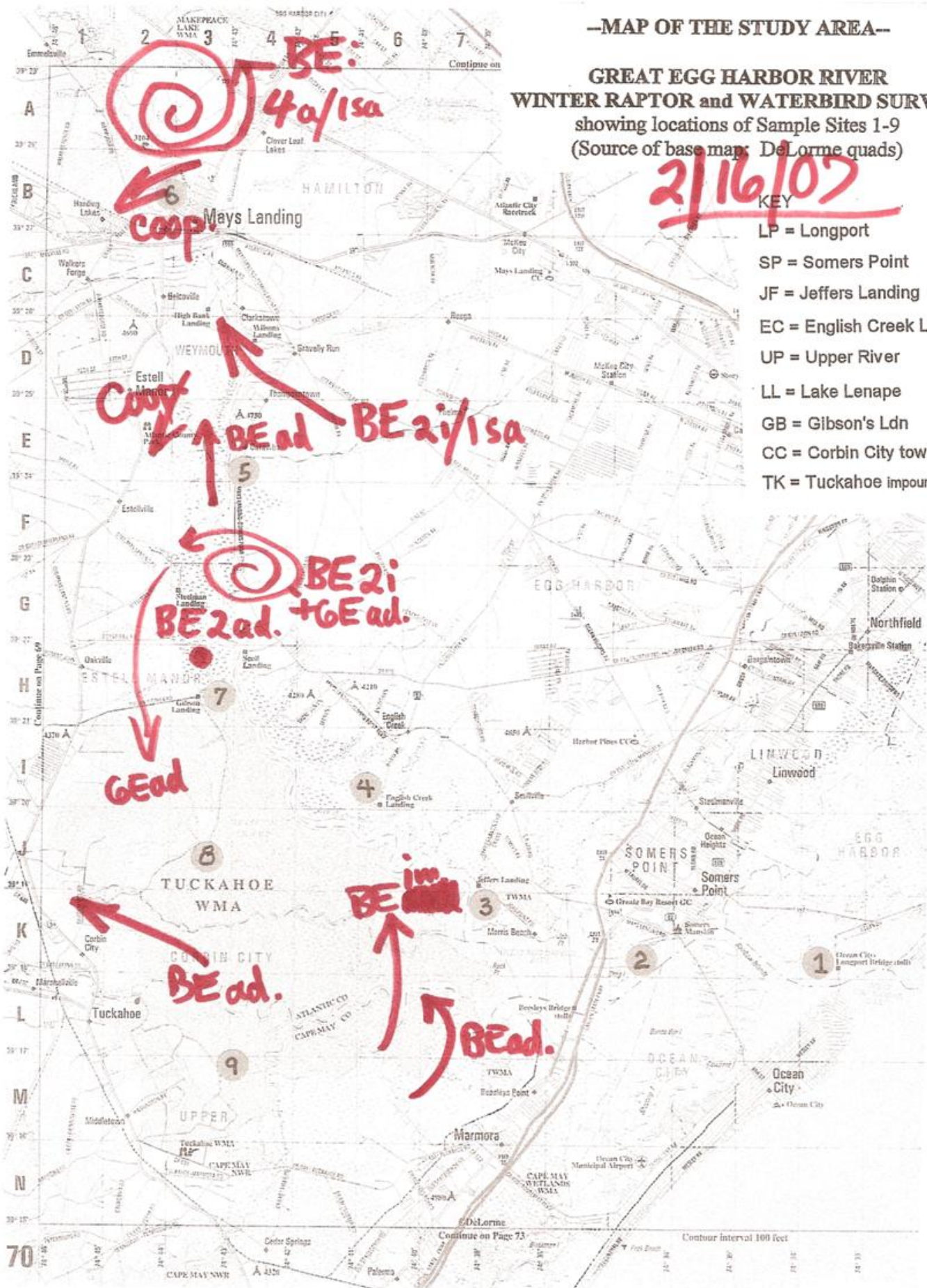


—MAP OF THE STUDY AREA—

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

2/16/07

- KEY
- LP = Longport
 - SP = Somers Point
 - JF = Jeffers Landing
 - EC = English Creek Ldn
 - UP = Upper River
 - LL = Lake Lenape
 - GB = Gibson's Ldn
 - CC = Corbin City tower
 - TK = Tuckahoe impoundment



--MAP OF THE STUDY AREA--

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

2/28/07
KEY
LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

UP = Upper River

LL = Lake Lenape

GB = Gibson's Ldn

CC = Corbin City tower

TK = Tuckahoe impoundments

BE ad
perched

BE ad
on nest

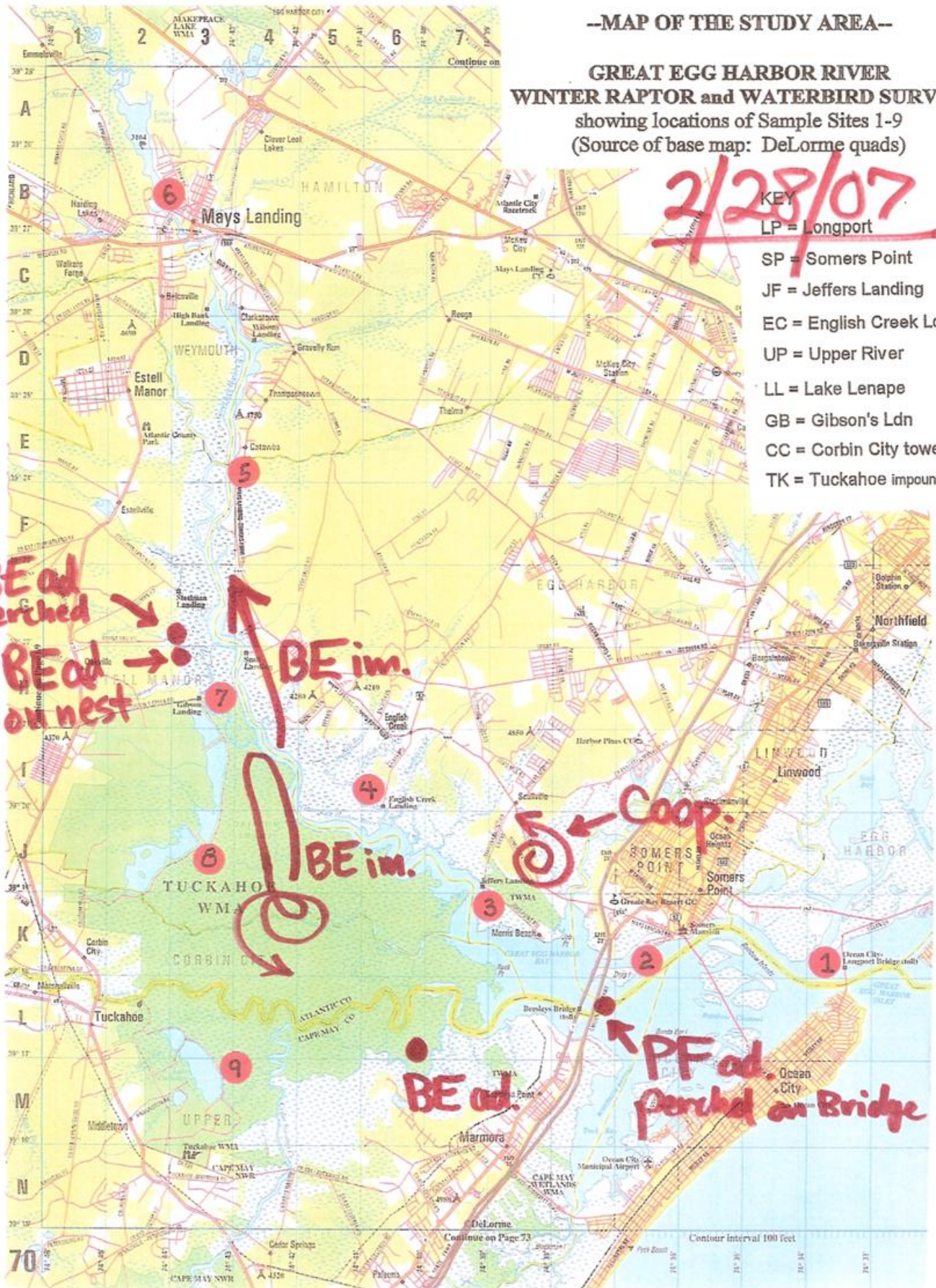
BE im.

BE im.

Coop.

BE ad.

PF ad
perched on Bridge

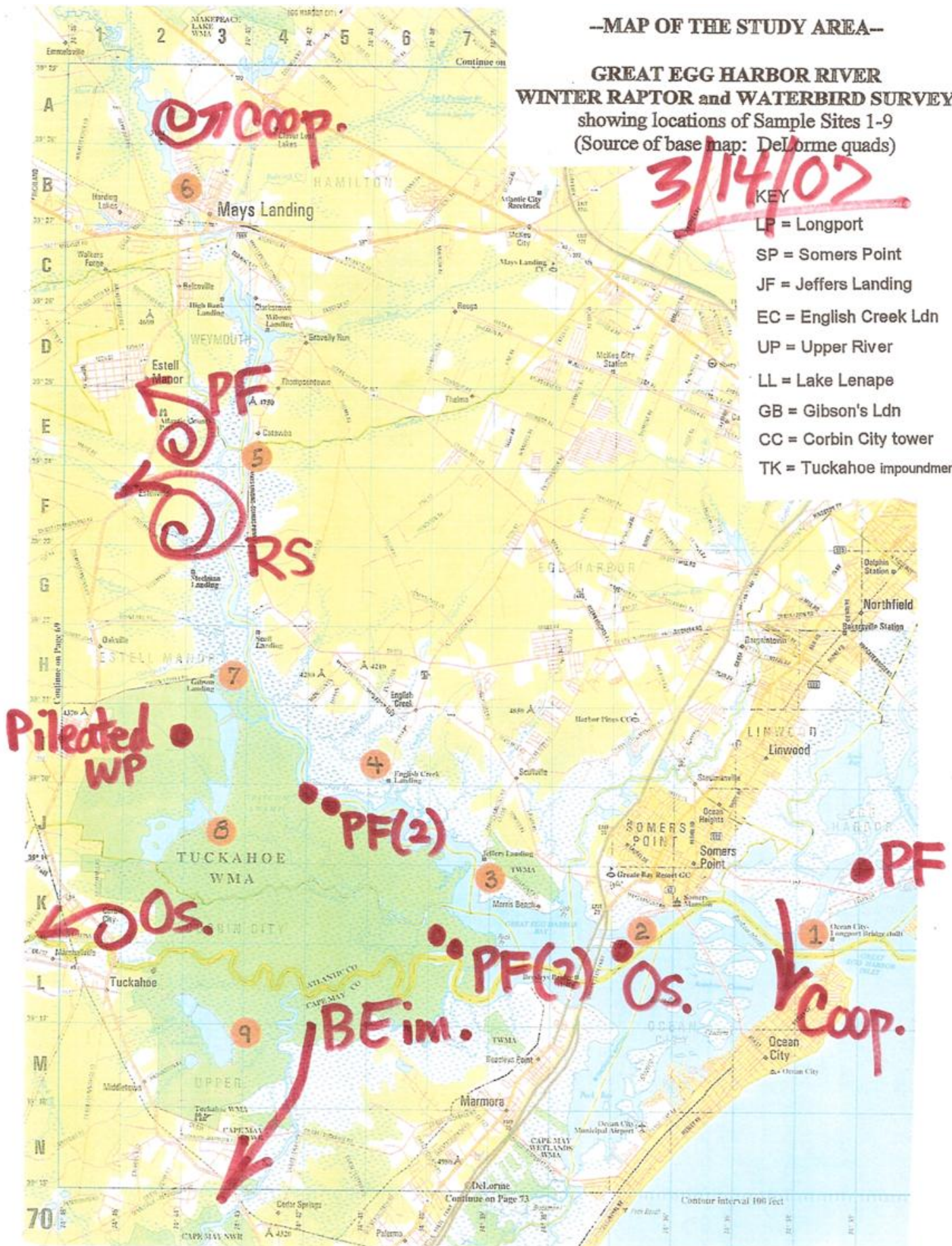


—MAP OF THE STUDY AREA—

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

3/14/02
KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



-MAP OF THE STUDY AREA-

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

3/22/07

KEY

LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

UP = Upper River

LL = Lake Lenape

GB = Gibson's Ldn

CC = Corbin City tower

TK = Tuckahoe impoundments



--MAP OF THE STUDY AREA--

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SUR**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

4/9/07

KEY
LP = Longport
SP = Somers Point
JF = Jeffers Landing
EC = English Creek
UP = Upper River
LL = Lake Lenape
GB = Gibson's Ldn
CC = Corbin City
TK = Tuckahoe

BE ad.

Cooper's

BE im.

BE ad.

BE ad.

BE im. Chasing Asp

4/9/07

LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

UP = Upper River

· LL = Lake Lenape

GB = Gibson's Ldn

CC = Corbin City tower

TK = Tuckahoe impoundments

YCNH - DOR

(Yellow-crowned Night-heron)

BE im.
Chasing Osprey

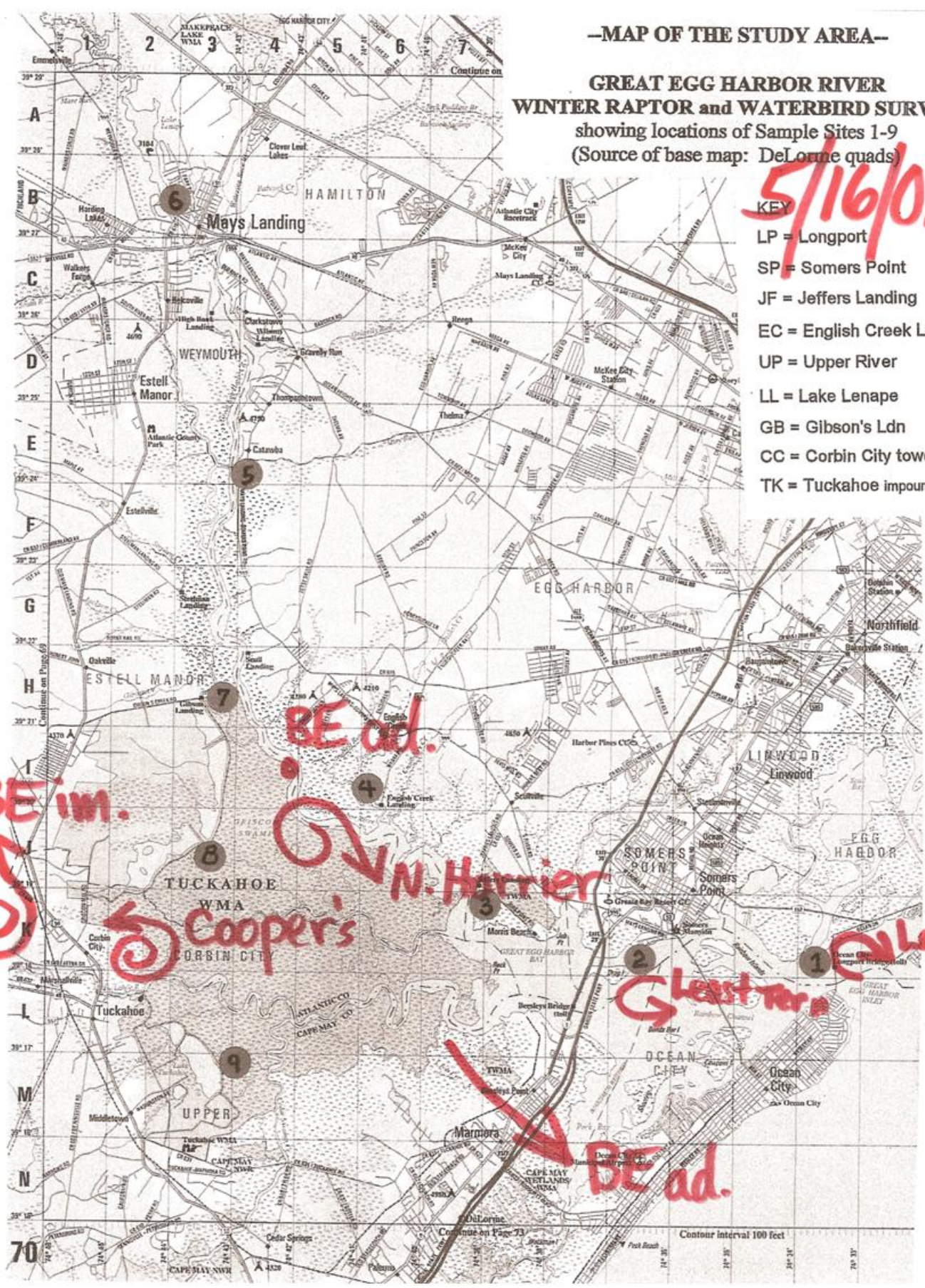
—MAP OF THE STUDY AREA—

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)

5/16/07

KEY
 LP = Longport
 SP = Somers Point
 JF = Jeffers Landing
 EC = English Creek Ldn
 UP = Upper River
 LL = Lake Lenape
 GB = Gibson's Ldn
 CC = Corbin City tower
 TK = Tuckahoe impoundments

BE im.
BE ad.
N. Harrier
Cooper's
Least
BE ad.



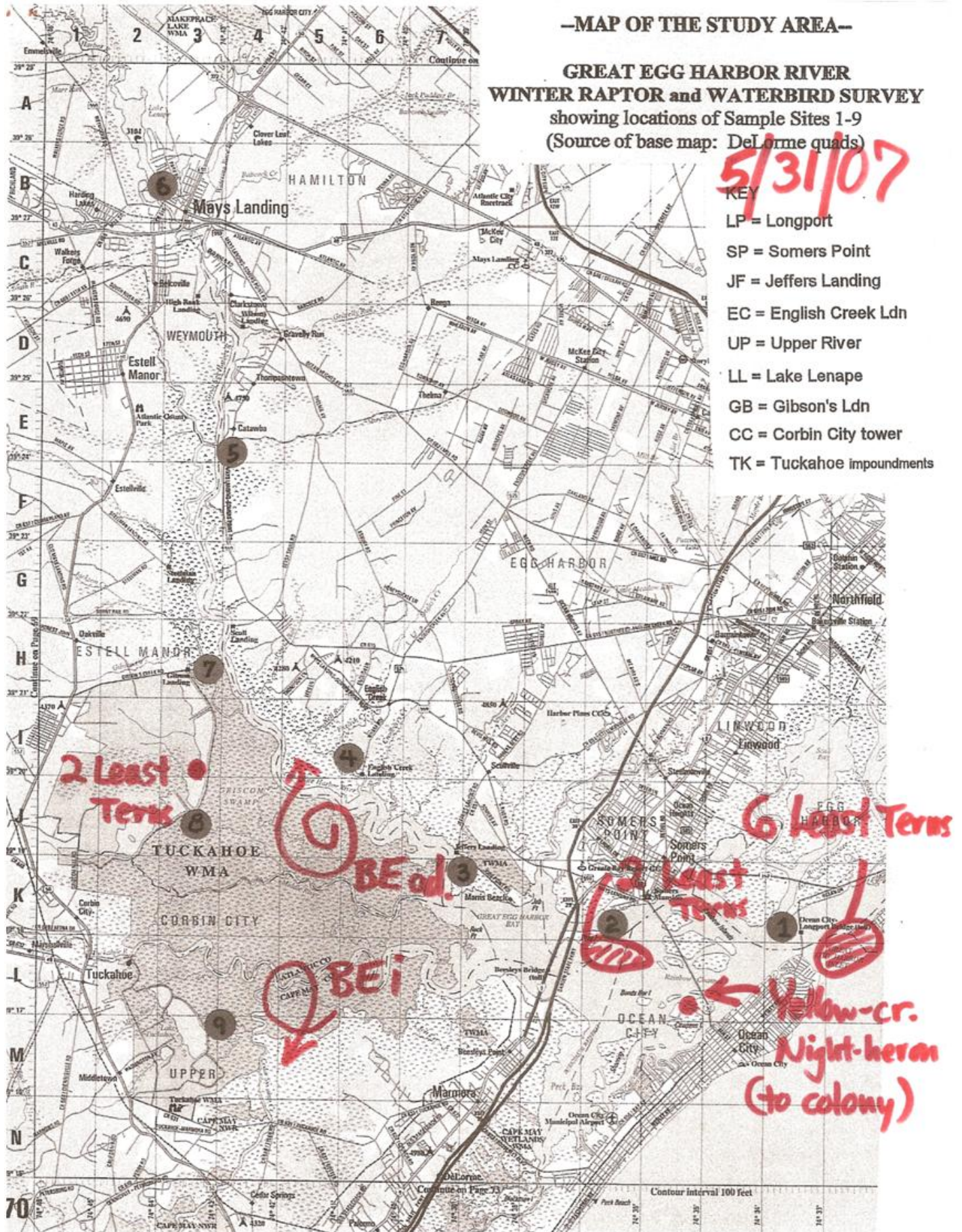
—MAP OF THE STUDY AREA—

GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY showing locations of Sample Sites 1-9 (Source of base map: DeLorme quads)

5/31/07

KEY

- LP = Longport
- SP = Somers Point
- JF = Jeffers Landing
- EC = English Creek Ldn
- UP = Upper River
- LL = Lake Lenape
- GB = Gibson's Ldn
- CC = Corbin City tower
- TK = Tuckahoe impoundments



APPENDIX 2.

Methodology and Sampling Site Maps

GREAT EGG HARBOR RIVER METHODOLOGY:

Two observers, Sutton and Dowdell, spent 45 minutes apiece at each of nine sampling sites. All raptors and waterbirds were tallied at each site, whether in flight or sitting (perched or on the water). All hawks and eagles were searched for in accordance with Sutton and Sutton (1996). Raptors were identified, aged, and sexed in accordance with Dunne, Sibley, and Sutton (1986), Clark and Wheeler (1987), and Wheeler and Clark (1995). Waterbirds were found and identified in accordance with Sibley (2000), Sutton, *et al.*, (2004), and, of course, the two authors' many years of extensive experience in Southern New Jersey and elsewhere.

Additional birds, most often raptors, observed *between* official count sites were recorded if and only if the observers were confident it had not been previously counted. For example, a low-flying Cooper's Hawk dashing across the road would be added to the count if it had not been observed at the previous site. While the nine sampling sites were generally far enough apart to preclude "double-counting," the observers used extreme care to avoid recounting the same bird or birds. For example, eagles range widely up and down the river; a Bald Eagle roosting at Lake Lenape may range east to Tuckahoe WMA or farther. A "new" eagle would only be counted when direction of flight, age, plumage, or circumstance would allow the observers to confidently assess that it could not possibly have been already counted. Due to such constraints, counts of raptors, particularly eagles, are thought to be conservative. As discussed below, the Great Egg basin is a very large area, extremely wide in the lower portions.

The nine count locations, the official sampling sites, are shown on **Map 1**. Some sites did have supplemental count locations (labeled A, B, and C on our field maps, but not on Map 1) to allow for all areas to be seen and thereby all birds counted. For example, the Tuckahoe WMA site, Site 9, southeast of Tuckahoe has three impoundment pools, and not all pools can be viewed or counted from the same location. Therefore, the Site 9 count is a composite of tallies taken at three separate locations, but only one final tally is given for the site on the daily and summary data sheets. In this case, the 45 minutes are expended at the three stops put together. Only by using such alternate viewing locations could all birds, particularly waterbirds, be reasonably and reliably tallied.

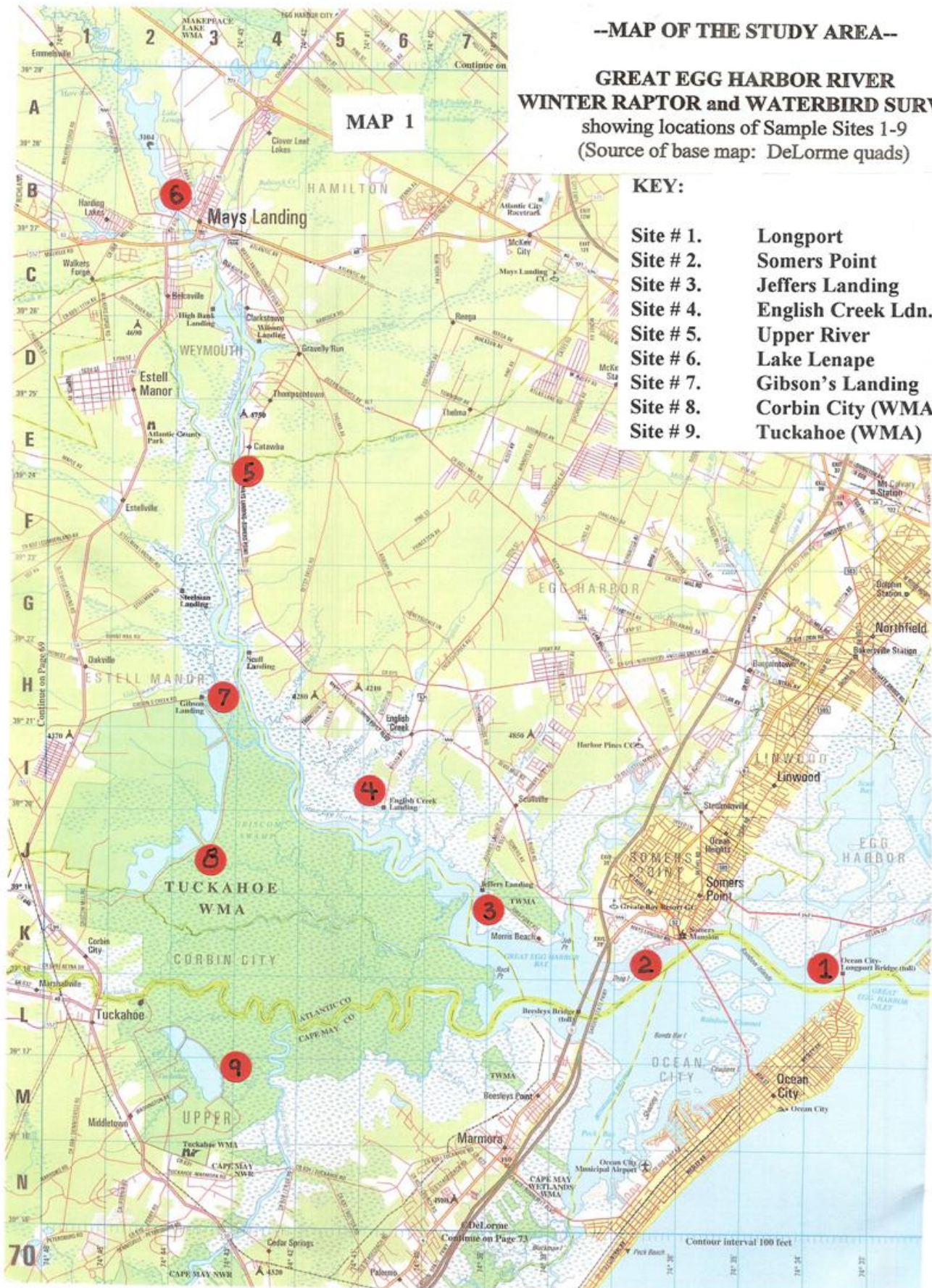
In order to avoid bias in the sampling technique, the route was reversed each subsequent sampling date, run “upriver” and then “downriver” on alternate sampling days. The nine sites ultimately settled upon as a reasonable and doable sampling route are as follows, (starting on the lower estuary and working upriver):

- (1) Longport Bridge Fishing Pier. This site allowed counting of the lower portion of Great Egg Harbor Bay and the Rainbow Channel/Rainbow Island area.
- (2) John F. Kennedy park in Somers Point. Allowed counting of the bay east of the Garden State parkway Bridge. An alternate site was employed here; the foot of the Route 9 Bridge over Great Egg Harbor bay (north end) allowed the bay west of the bridges to be seen and censused.
- (3) Jeffers Landing, including alternate sites on Job’s Point Road and Jeffers Landing Road.
- (4) English Creek Landing, at Wharf Road.
- (5) The “Upper” tidal river. The principal count location was from the Shady River Marina on Route 559. A supplemental site used was “the bulkhead” in Mays Landing just south of Route 40.
- (6) Lake Lenape. Observations were conducted from the spillway in Mays Landing.
- (7) Gibson Landing, at the end of Gibson’s Creek Road in the Corbin City unit of Tuckahoe WMA.
- (8) The observation tower on the dikes of the Corbin City unit of the Tuckahoe WMA. Here supplemental observation points were used in order to observe all of the various nooks and crannies of the several impoundments.
- (9) The Tuckahoe unit of the Tuckahoe WMA, including three supplemental stops which allowed all three impoundments to be viewed and counted. Particularly Site 9 allowed those raptors and waterfowl using the lower Tuckahoe River tributary to the Lower Great Egg Harbor River basin area to be included in survey results. This site was in Cape May County; all others were in Atlantic County.

To the greatest extent practicable, all counts were conducted in good weather. The observers carefully selected sampling days which were sunny and breezy, conditions which readily facilitate raptor hunting and movement along the river. Such conditions particularly allow for the best raptor counts (on cloudy, windless days raptors often spend much of their time perched, and therefore often are out of sight).

--MAP OF THE STUDY AREA--

**GREAT EGG HARBOR RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)



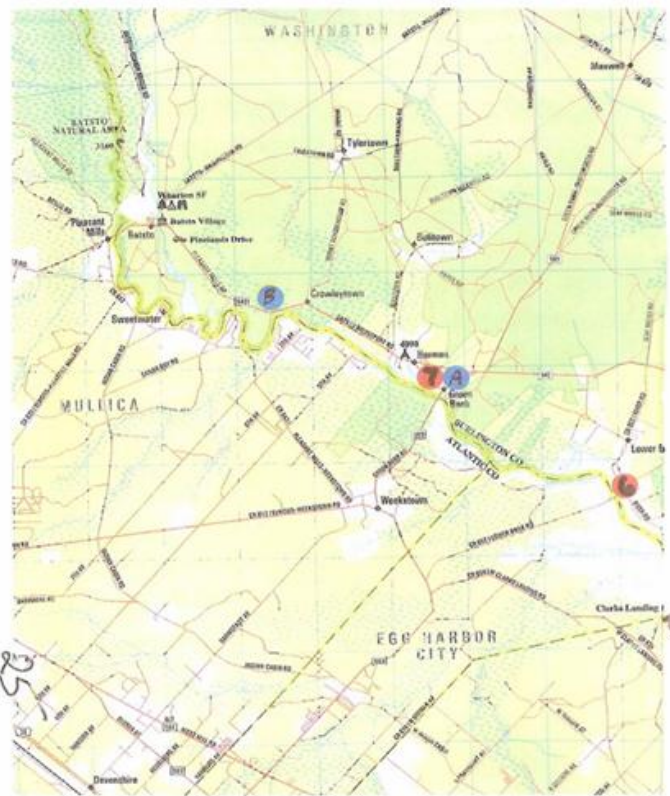
MULLICA RIVER METHODOLOGY:

The Mullica River study area and sample locations are shown on **Map 2**. The methodology used on the Mullica was designed to be identical to that used on the Great Egg: Nine sample locations were established on the Mullica between Green Bank in the west and on downriver to Great Bay Boulevard near Little Egg Inlet. Each site was visited for approximately 45 minutes each during a given survey. Sampling direction was reversed every other survey to avoid time-of-day bias. There is some difference in the geographical scope of the study areas. The Great Egg River, from Lake Lenape east to the Longport Bridge constitutes about 12 linear miles (direct miles, not accounting for turns on the river). The Mullica River, on the other hand, is about 15.6 linear miles in length from Green Bank east to the landing at the foot of Great Bay Boulevard (Seven Bridges Road). While it bears noting that the study area on the Mullica is longer, no attempt has been made (as yet) to compare width or acreage (or habitat types) of the comparative study areas. This can be carried out in future years as part of future in-depth comparisons.

Any avian discussion of the Mullica River complex and Great Bay must include discussion of Forsythe National Wildlife Refuge, a.k.a. “Brigantine.” While not technically/geographically in the study area, it exerts a tremendous influence on the birds of the region - particularly waterfowl. Just as the quality impoundments at Corbin City and Tuckahoe WMAs attract and concentrate ducks and geese (and as the Bivalve EEP does on the Maurice River), Brigantine by its sheer size and quality of habitat (vast impoundments) attracts and concentrates vast numbers of Mullica River region waterfowl. But where Corbin/Tuckahoe can be counted because they are “within” the study area, the impoundments at Brig are adjacent to Reeds Bay, Little Bay, and Brigantine Inlet - and are not really a part of Great Bay or the Mullica River system.

None-the-less, Forsythe exerts a massive influence on Mullica waterfowl. Because of the size and high quality of the impoundments, as well as the relative safety from hunting pressure, the NWR clearly pulls in birds from the Mullica. As one person aptly put it, “Brigantine simply ‘sucks in’ most of the area’s waterfowl.” And while many return to the nearby Mullica River to feed at night, by day they are safely back at the refuge, sanctuary, and feeding station that is Forsythe NWR.

While one could make a case to include this site and its birds in a Mullica count, to do so would bias the count to such a degree that comparisons to the Great Egg and/or other rivers would be moot and meaningless. For example, few Green-winged Teal and virtually no Pintails were counted on Mullica surveys, but at the same time, just two miles away, perhaps 10,000 teal and 10,000 pintails were known present. It is a dilemma with no real answer - to count Brig birds would be to bias the count beyond comparability (plus it would take 6-8 hours each survey to truly census the Refuge...) But, at the same time, to not count Brigantine waterfowl will forever undercount (and so bias) any Mullica survey efforts. Such are the issues with Forsythe NWR, one of the premier refuges in the country, and the implications when attempting hard comparisons to the Great Egg Harbor River.



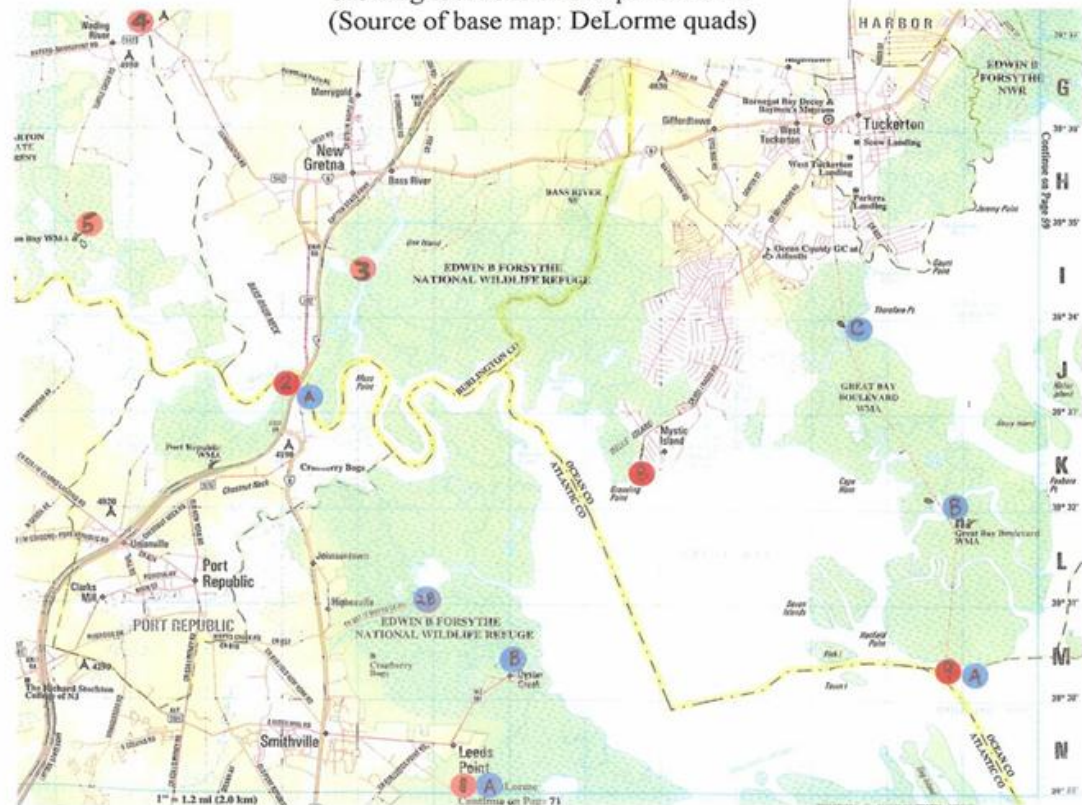
KEY:

- | | | |
|-----------|-----------------------|------|
| Site # 1. | Leed's Point | (LD) |
| Site # 2. | GSP Bridge | (BR) |
| Site # 3. | Amassas Landing | (AM) |
| Site # 4. | Wading River Bridge | (WD) |
| Site # 5. | Swan Bay WMA | (SW) |
| Site # 6. | Lower Bank | (LB) |
| Site # 7. | Green Bank | (GB) |
| Site # 8. | Graveling Point | (GP) |
| Site # 9. | Seven Bridges Road | (SB) |
| | (Great Bay Blvd. WMA) | |

MAP 2

--MAP OF THE STUDY AREA--

**MULLICA RIVER
WINTER RAPTOR and WATERBIRD SURVEY**
showing locations of Sample Sites 1-9
(Source of base map: DeLorme quads)



APPENDIX 3

Funding Sources for the 2006-2007 Raptors and Waterbirds on the Great Egg Harbor River Systematic Study of an Important Avian Wintering Area

Funding Sources for the 2006-2007 Raptors and Waterbirds on the Great Egg Harbor River Systematic Study of an Important Avian Wintering Area

National Park Service “Challenge Cost Share Program” \$4,375

In 2004, the National Park Service offered a special “Challenge Cost Share Program” grant opportunity that would contribute \$4,375 to the 2006-2007 Winter Raptor and Waterbird Survey. The “challenge” aspect of this special grant required that an equal amount of funding needed to be contributed to the project from non-federal sources to match and share the costs. The non-federal matching cost share funds for this year’s survey came from a \$3,000 grant from Conectiv Energy, and a \$1,375 grant from the Estate of Lynn Ward. Historically, National Park Service (NPS) funding has been the prime source of funding for this 5 year project, but this year the NPS successfully brought \$4,375 of non-federal funds to the project through the Challenge Cost Share Program.

Conectiv Energy Sponsorship \$3,000

This is the second year that Conectiv Energy has invested in this ground breaking 5 year avian baseline data gathering process for the Great Egg Harbor River and Mullica River Estuaries. Conectiv Energy’s strong support for this project has been critical to the quality and scope of the data collected over the last two years, and their sponsorship for this year’s report leveraged the National Park Service contribution and other funding for the project. To date, Conectiv Energy’s total contribution to the 5 year project is \$7,000. The Great Egg Harbor Watershed Association truly appreciates having Conectiv Energy as a project partner

Estate of Lynne Ward Sponsorship \$1,375

The Estate of Lynne Ward contributed \$2,225 in 2005 to enable the first Mullica River comparison studies for the Winter Raptor and Waterbird Survey in 2004-2005, and this year the Estate of Lynn Ward has provided \$1,375 of the non-federal match for the National Park Service’s Cooperative Cost Share Grant along with Conectiv Energy.

Lynne’s father, James Akers, was one of the founders of the Atlantic Audubon Society and an extraordinary ornithologist and conservationist for Southern New Jersey in the 1960’s and 1970’s. His life was cut short in 1978 when he accidentally drowned in the Delaware Bay while leading fall migration activities in Cape May. In February 2004, Lynne died from ovarian cancer.

Just prior to her death, Lynne Ward requested that a portion of her modest estate be used to fund GEHWA’s continuing avian research project on the Mullica River, not far from one of her father’s favorite conservation locations, the Forsythe National Wildlife Refuge. To date, the Estate of Lynne Ward’s total contribution to the project is \$3,600.

Conectiv Energy Again Supports Great Egg Harbor Research

Conectiv Energy recently contributed \$3,000 to the Great Egg Harbor Watershed Association to help the organization continue its valuable environmental research. The Great Egg Harbor River and Bay and the Mullica River and Great Bay have long been known for their abundance of birds. But little has been done until now to scientifically document the number and diversity of this abundance, said Fred Akers, Administrator of the Great Egg Harbor Watershed Association. With this very important financial support from Conectiv Energy for a second year, the association will be able to continue and broaden its bird survey work to discover and provide cornerstone avian resource data to be used for river management and protection, Fred said.

“We are very pleased to be able to contribute again to this important work in the watershed,” said Andrew Shawl, Environmental Coordinator at the nearby B.L. England Generating Station, which is operated by Conectiv Energy. The 2006-2007 survey season will be the fourth year of a minimum five-year survey program. Conectiv Energy’s support of this effort will help to ensure that the program goals are realized. The Great Egg Harbor Watershed Association thanked Conectiv Energy for the financial support of this stewardship project. Successful public private partnerships like this are fundamental to the protection of the resources of the Great Egg Harbor and Mullica Rivers, Fred said.



From left: Andrew Shawl, Fred Akers and CE's Chuck May

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